



ERTMS DEPLOYMENT IN GERMANY

ERTMS THE BASIS FOR DIGITAL RAIL PROGRAM



Germany is located in the heart of Europe and is therefore a central node of the European railway network with borders to many countries. There are 6 ETCS corridors crossing Germany, thus Germany forms the hub in rail traffic for people and goods and plays an important role for the deployment of ERTMS in Europe. Whilst many countries have already started implementation of ambitious ERTMS roll out programs, Germany is now pushing the implementation of ERTMS. In 2018 Deutsche Bahn has introduced its ambitious program "Digitale Schiene Deutschland" (digital rail Germany) which is based on the rollout of ERTMS on the railway network in Germany.

Status of ERTMS deployment in Germany

GERMANY A PIONEER IN ERTMS

In 1997 it was decided to equip the first line, Halle/Leipzig-Berlin, with ETCS Level 2 in Germany. More than 1.100 balises were installed on this 155km long line and 4 radio block centers (RBC) were connected to existing electronic interlocking.

On July 7th, 2003 for the first time in Europe an ERTMS-controlled passenger train operated at a speed of 200kph between Jüterbog and Bitterfeld. Germany became a technical pioneer in the testing and development of ERTMS in Europe.

Deutsche Bahn has subsequently tested ETCS Level 1, Level 2 as well as ETCS L1LS systems on its network between Berlin - Frankfurt/Oder. All operational systems were evaluated under real operating conditions.



Where is ERTMS deployed in the Germany?

The Federal Republic of Germany notified the early migration plan in 2003 or first national deployment plan in 2007 with projects like Southern Berlin outer ring, Aachen-Belgium border, the POS Nord, Ludwigsfelde-Leipzig and Nuremberg-Ingolstadt-Munich.

How about ERTMS fitted Rolling Stock in Germany?

A significant number of rolling stock is being equipped with ERTMS in Germany. The majority of the so called "White Fleet" – the long distance passenger high speed trains of Deutsche Bahn – have been retrofitted with ERTMS already. The fleet comprises of more than 186 high speed trains of several classes – "ICE 1", "ICE 3" and "ICE -T" trains. The trains are the backbone of the high speed long-distance passenger transportation network (ICE) in Germany with additional links to its neighbourhood countries like Switzerland and France for example.

In 2010 Deutsche Bahn ordered the next generation trains which are equipped with ERTMS by default. The new train class is branded with "ICE4" and enlarges the existing ICE fleet by 119 vehicles and also replaces the obsolete Intercity (IC) trains for medium and long distance operation. On the other hand, Deutsche Bahn also drives the modernization of its cargo fleet. A frame contract covering the delivery of 450 ERTMS fitted locomotives has been awarded in 2013. Beside of these major investments into ERTMS onboard continuing fitment of yellow fleet and existing rolling stock can be seen. The number of ERTMS fitted vehicles will continuously increase in the future along with further deployment of ERTMS lines in Germany.





Travelling with 300kph from Leipzig to Erfurt - with European Train Control System

As part of the so called VDE 8 "German Unification Traffic" program, the new high speed line Erfurt / Leipzig / Halle went into commercial service at the timetable change in December 2017.

The new line has been equipped with the European train control system ETCS Level 2 Baseline 2 without line side signals and without legacy "fall back" system.

This shows the maturity of ERTMS in function and marketwise. Real interoperability is demonstrated since the supplier of trackside equipment and the ERTMS onboard units are supplied by different companies.

ERTMS implementation strategy in Germany – part of Digitalization program

In 2018 Deutsche Bahn has launched its ambitious program "Digitale Schiene Deutschland" (digital rail Germany) which is based on the rollout plan of ERTMS on the railway network in Germany.

The main target of this program is to achieve performance increase – by increased throughput of the lines, a higher level of quality – by reducing delays and last but not least an improved efficiency of the rail infrastructure. With the digitization of the entire rail network, Deutsche Bahn aims to increase train capacity by up to 20 percent and thus allow thousands of additional trains per day. This target can only be achieved if the infrastructure is equipped with the most modern control and safety technology - ERTMS. Deutsche Bahn sees this program as a key element in implementing the transport policy goal of getting more traffic onto the rails.

Between 2020 and 2023 the majority of the traction vehicles shall be equipped with ERTMS. From 2023 to 2030 Deutsche Bahn plans to equip large parts of the network with digital interlockings and ETCS Level 2. The remaining infrastructure shall be modernized by 2037.

Automatic train operation (ATO) is also an important pillar of the digitalization strategy of Deutsche Bahn. In 2018 a project for S-Bahn Hamburg has been started with the aim to implement ATO over ETCS on a 23 km segment of the S-Bahn's rail network. The project comprises the installation of ETCS Level 2 including adaptations on the trackside as well as equipping 4 trains for automated operation. The realisation date of the project is planned for 2021. The project is seen to contribute to the further roll out of the ATO over ETCS technology in Germany.

The implementation strategy of ETCS by Deutsche Bahn consists of four essential elements:

- Introduction of ETCS on four leading European freight corridors (TSI ZZS and EU Regulation 913/2010) first step: the German part of the freight corridor A - 1300km long section Emmerich-Basel (mixed level ETCS Level 1LS and Level 2)
- Equipping of all new lines connected to VDE 8 (according to TSI ZZS) and important European TEN routes
- Equipping 7 border crossings until 2023 (operating points) between Germany and Belgium, France, the Netherlands, Luxembourg and Austria with ETCS and the respective national systems to enable dynamic transitions.
- After 2025 the German legacy system LZB will be replaced by ETCS L2 only

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